

CLAIMS

1. An active matrix electroluminescent display device comprising an array of display pixels (1), each pixel comprising:
 - an electroluminescent (EL) display element (2);
 - a drive transistor (22) for driving a current through the display element;
 - a current sampling resistor (30), wherein the EL display element (2), the drive transistor (22) and the current sampling resistor (30) are in series between first and second power lines (26; 32); and
 - circuitry (38, 40) for providing a feedback signal or signals representing the voltage drop across the current sampling resistor (30) to at least one feedback line (34, 36),
 - wherein the display device further comprises processing means for processing pixel drive signals (52) in dependence on the feedback signal or signals.
2. A device as claimed in claim 1, wherein the circuitry for providing a feedback signal or signals comprises a first sampling transistor (40) connected between one terminal of the current sampling resistor (30) and a first feedback line (36).
3. A device as claimed in claim 2, wherein the circuitry for providing a feedback signal or signals further comprises a second sampling transistor (38) connected between the other terminal of the current sampling resistor (30) and a second feedback line (34).
4. A device as claimed in claim 2 or 3, wherein each pixel further comprises an address transistor (16), connected between a data input line (6) and the gate of the drive transistor (22) and wherein the gates of the address transistor (16) and the or each sampling transistor (38, 40) are controlled by a shared address line (4).

5. A device as claimed in claim 4, wherein each pixel further comprises a second address transistor (60), wherein the second address transistor is connected between the one terminal of the current sampling resistor (30) and a current drain line (62).

6. A device as claimed in claim 5, wherein the second address transistor (60) is controlled by the shared address line (4).

7. A device as claimed in any one of claims 1 to 4, wherein the processing means comprises a first amplifier (50) which receives the feedback signal or signals (34, 36) and derives therefrom an output dependent on the current flowing through the current sampling resistor (30), and a second amplifier (54) which receives the output dependent on the current flowing through the current sampling resistor and the pixel drive signal (52) and provides a modified pixel drive signal.

8. A device as claimed in claim 5 or 6, wherein the processing means comprises a first amplifier (50) which receives the feedback signal or signals (34, 36) and derives therefrom an output dependent on the current flowing through the current sampling resistor (30), a sample and hold circuit (72) for holding the output value, and a second amplifier (70) for receiving the held output value and the output dependent on the current flowing through the current sampling resistor.

9. A device as claimed in claim 8, wherein the data input line (6) is switchable between a power supply line voltage (V_{SUPPLY}) and the output of the second amplifier (70).

10. A device as claimed in claim 8 or 9, wherein the device is operable in two modes:

a first mode in which a desired pixel drive current is driven through the current sampling resistor (30) and the second address transistor (60) to the

current drain line (62), and the output dependent on the current flowing through the current sampling resistor is stored; and

a second mode in which a current is driven through the drive transistor (22) and the EL display element (2) and the output dependent on the current flowing through the current sampling resistor is provided to the second amplifier (70) for comparison with the stored output value, the second amplifier providing the data input line (6) voltage.

11. A method of addressing an active matrix electroluminescent display device comprising an array of display pixels, in which each pixel comprises an electroluminescent (EL) display element (2), a drive transistor (22) for driving a current through the display element and a current sampling resistor (30) in series with the EL display element and the drive transistor, the method comprising, for each pixel:

applying a drive signal (52) to the pixel representing a desired current;
obtaining a feedback signal representing the current flowing through the display element by sampling a voltage on the terminals of the resistor (30) in series with the EL display element; and

using the drive signal (52) and the feedback signal to generate a modified pixel drive signal such that the current flowing is equal to the desired current.

12. A method as claimed in claim 11, wherein using the drive signal and the feedback signal comprises differentially amplifying the signals.

13. A method as claimed in claim 11 or 12, wherein sampling a voltage on the terminals of the resistor (30) in series with the EL display element comprises tapping the voltage from each terminal to a differential amplifier.

14. A method as claimed in claim 11 or 12, wherein sampling a voltage on the terminals of a resistor in series with the EL display element comprises

tapping the voltage from one terminal, the voltage on the other terminal comprising a known supply voltage.

15. A method of addressing an active matrix electroluminescent display device comprising an array of display pixels, in which each pixel comprises an electroluminescent (EL) display element (2), a drive transistor (22) for driving a current through the display element and a current sampling resistor (30) in series with the EL display element and the drive transistor, the method comprising, for each pixel:

- driving a desired current through the current sampling resistor and not through the display element;

- obtaining a feedback signal representing the corresponding voltage drop across the current sampling resistor;

- storing the feedback signal; and

- using the stored feedback signal as a feedback control signal for subsequently driving current through the display element by applying a voltage to the gate of the drive transistor, the feedback control signal being used to determine the gate voltage.

16. A method as claimed in claim 15, wherein using the stored feedback signal comprises applying the stored feedback signal and a second feedback signal during driving of the display element to a differential amplifier, and using the differential amplifier output to control the drive transistor.

17. A method as claimed in claim 16, wherein the second feedback signal is obtained by sampling a voltage on the terminals of the current sampling resistor.